

OBSERVATIONS ON TURKISH BROME-GRASSES. I. SOME NEW TAXA, NEW COMBINATIONS AND NOTES ON TYPIFICATION

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ABSTRACT. In the genus *Bromus* (Gramineae) two new species are described and two new combinations at subspecific rank are made. The genus *Boissiera* is reduced to sectional rank within *Bromus*. Eleven names (ten of them Linnaean) are discussed and typified.

INTRODUCTION

A monograph of *Bromus* in Turkey will appear in Volume 9 of *Flora of Turkey* in which a number of new taxa and combinations are incorporated, as well as an extended sectional treatment of the genus.

The new names and combinations are published herein, with notes on typification, and some discussion. A full account of the taxonomy of *Bromus* in Turkey, and its connections with variation patterns in neighbouring territories as revealed in recent papers and Floras, will appear subsequently. Additionally it has been thought helpful to record the author's views on the typification of certain Linnaean and other brome-grass taxa which occur in the Turkish flora.

A NEW SECTION FOR *BROMUS PUMILIO*

The transference of this species to *Bromus* was made by Smith (1969). Previously it was placed in the monotypic genus *Boissiera* Hochst. ex Steudel, as *Boissiera squarrosa* (Solander) Nevski. It was argued that the similarities of the species to brome-grasses, especially those of sect. *Bromus*, outweighed the differences, largely of striking but superficial morphological characters which give it such a distinctive facies. In particular, the nerves of the lemma, and their production into 5-9 flattened, twisting awns, though certainly a distinctive feature, is regarded as a development of the form seen in *B. danthoniae* Trin. In that species, all (or sometimes only the upper) lemmas bear three awns which vary in size. There is considerable variation in the awn character in both species. A connection with sect. *Bromus* was noted by Penzes (1936). In most other morphological characters *B. pumilio* shows considerable similarity to *B. danthoniae*, *B. lanceolatus* Roth and *B. alopecuroides* Poir., which are undoubtedly closely related to it evolutionarily. Selection pressures, which may have favoured the *B. pumilio* awn features, may have had to do with maximizing photosynthesis and dispersal (Smith, 1969), and/or minimizing grazing damage.

The basic chromosome number of *B. pumilio* is 7, as in all brome-grasses so far counted. Further evidence of congeneric relationship with *Bromus* came from high levels of seed protein resemblance (Smith 1969, 1983). Nevertheless, there are some reasons for classifying *B. pumilio*

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somewhat apart from the other brome-grasses of section *Bromus*, arising from its dispersal mechanism.

Unlike *B. danthoniae* and its close relatives, *B. pumilio* has most, if not all, of the upper florets commonly sterile, no caryopsis or only a vestige being produced. The upper florets clearly have other functions. Possible anti-grazing and photosynthetic functions of the upper awns, mentioned above, are shared with those of *B. danthoniae*. However, in *B. pumilio* the floret does not appear to be the dispersal propagule; rather, the whole spikelet above the glumes (persistent, as in all brome-grasses) is detached and dispersed as a unit (Scholz, 1978). This is achieved by the absence of clearly defined abscission zones between the upper florets and the rhachilla nodes. The single abscission zone lies just above the glumes. Rhachilla internodes are relatively longer than in most other *Bromus* species. The propagule is efficiently plucked from the paired glumes by mechanical contact with the spreading awns, and perhaps also by wind. Modest hygroscopic properties may reside in the dead awn bases. The effect of the awns and abscission characters together is to create a flighted, sharp-pointed disseminule, effectively dispersed by animals or wind, which, once lodged in a cavity, is unlikely to move further.

Many of the morphological differences between the sections of *Bromus* rest upon dispersal-related adaptations of one kind or another. It therefore seems appropriate to place *B. pumilio* in a section of its own, within *Bromus*.

Sect. **Boissiera** (Hochst. ex Steudel) P. M. Smith, **comb. et stat. nov.**

Syn.: *Boissiera* Hochst. ex Steudel, Syn. Pl. Glum. 1:200 (1854) pro. gen.

Annual plants. Spikelets terete, lanceolate at first, later developing widely divaricate or spreading awns above; disarticulating between the glumes and the lowest floret only. Rhachilla internodes long (up to about $\frac{1}{2}$ the length of the lemma). Lower glume 3-veined, upper glume 5-9-veined. Lower floret, or rarely the lower pair of florets fertile, the upper sterile. Lemma rounded on the back, and bearing 5-9 awns just below an erose, hyaline tip. Awns flattened at base, eventually divaricate, patent or (rarely) recurved, mostly as long as or longer than (upper florets) their lemmas.

Type: *Bromus pumilio* (Trin.) P. M. Smith; the only species in the section recorded to date.

Native distribution: Central and SW Asia, eastern Mediterranean area.

NEW TAXA

***Bromus psammophilus* P. M. Smith sp. nov.** Fig. 1.

Gramen annum. Culmi erecti, 25-30cm alti, vaginis foliisque dense pilosis. Panícula rigida, erecta, laxa, late ovata, 7-8cm longa. Rami paniculae graciles, ascendentes, recti vel flexuosi, 2-25mm longi. Spiculae compressae, lanceolatae, puberulentes, 10-15mm longae. Glumae inaequales, inferior lanceolata, 3-3.5mm longa, superior ovato-lanceolata, 4-4.5mm longa. Lemma subcorneum, ovatum, 5.5-6mm longum, marginibus angulosis prominenter, apice haud profunde emarginato, palea vix longius. Arista absens. Palea bicarinata, nervis ciliatis. Antherae 2-2.5mm longae. Caryopsis plana, oblanceolata, palea vix brevior.

A *B. pseudosecalino* caryopside plana, panícula lata, marginibus angulosis lemmatis, forma spicularum et absentia aristae differt. A *B. pseudobrachystachye* et *B. tigris* panícula rigida et latiora, spiculis compressis et absentia aristae differt. A *B. brachystachye* caryopside in proportione breviora, absentia aristae differt. A *B. arvense* panícula compacta, rigida, forma lemmatis spicularumque et absentia aristae differt. A *B. briziforme* forma paniculae (multispiculata, erecta, haud subsecunda), spiculis brevioribus et angustioribus, numquam nutantibus et lemmate subcorneo differt.

Type: S Turkey C5 Icel: Tarsus, dunes, 3 vi 1973, *T. Uslu* 36425, sub *B. briziformis* (holo. E).

This new species, so far known from only a single specimen, but of quite striking characteristics, falls into the same species group, within section *Bromus*, as *B. pseudosecalinus* P. M. Smith, *B. tigris* Boiss. & Noë and *B. pseudobrachystachys* H. Scholz. It is perhaps also similar to *B. brachystachys* Hornung. This group is discussed by Scholz (1972).

***Bromus strictostachys* P. M. Smith sp. nov. Fig. 2**

Gramen annum. Culmi erecti, 3–23 cm alti, vaginis glabris. Laminae rigide erectae, plicatae, subpungentes, subtus glabrae sed supra dense et breviter pubescentes. Ligulae acutae, 2–3 mm longae. Panícula rigide erecta, contracta anguste lanceolata vel sublinearis, 1–8 cm longa, 2–8 mm lata; ramis brevissimis saepe simplicibus, quam spiculis brevioribus. Spiculae anguste lanceolatae, glabrae, nitidae, 8–13 mm longae, 1–2.5 mm latae. Glumae inaequales, inferior lanceolata, 3-nerva, 4.5–5.5 mm longa, superior lanceolata, 3–5-nerva, 5–6 mm longa. Lemma chartaceum, anguste lanceolatum, acuminatum, 7.5–8.5 mm longum, prominenter nervosum, marginibus hyalinis, obtuse angulosis, apice breviter emarginato. Lemmata, praeter infima, $\frac{1}{3}$ infra apicem aristata. Arista contorta infra partem centralem, divaricata vel patens, gracillima, 8–10 mm longa, quam lemma longior. Palea bicarinata, nervis ciliatis, quam lemma brevior. Antherae 1–1.5 mm longae. Caryopsis plana, anguste oblanceolata.

A *B. scoparius* panícula anguste lanceolata vel sublineari, ligula acuta, laminis rigidis et subpunctis, breviter pubescentibus (non pilosis), et absentia aristae lemmatibus infimis differt. A *B. alopecuro* paniculis et spiculis brevioribus, texto laminae et absentia aristae lemmatibus infimis differt.

Type: W Turkey B2 Uşak: 18 miles S of Uşak, on road to Sivaslı, 800 m, in open *Pinus nigra*/*Quercus* woodland, 14 vi 1965, *Coode & Jones* 2444 (holo. E).

This striking taxon shows greatest morphological resemblance to *B. scoparius*, with which it undoubtedly has close affinity. Its most obvious morphological distinction is the extremely narrow panicle. This character is manifested as soon as the panicle emerges from the sheath, and is maintained into the adult state. Though there is much variation in the panicle shape of *B. scoparius* (from ovate to lanceolate, to flabellate and verticillate) this material seems rather distinctly different. *B. scoparius* specimens grown in poor water (or nutrient) regimes often exhibit feeble

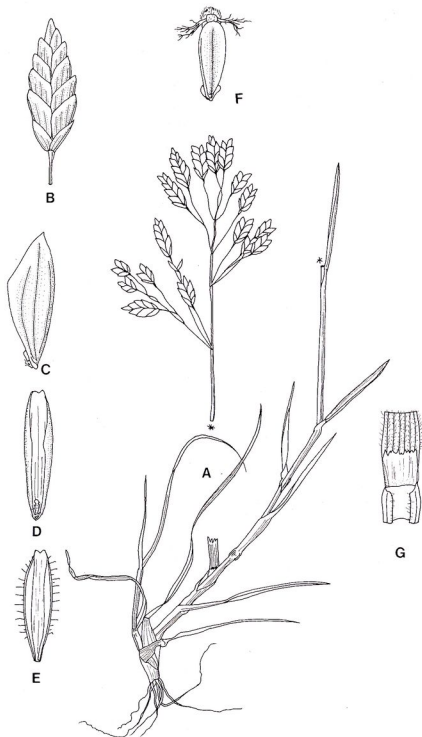


FIG. 1. *Bromus psammophilus*: A, habit, $\times 1.2$; B, spikelet, $\times 5$; C, floret, side view, $\times 8$; D, lemma, adaxial view, $\times 8$; E, palca, adaxial view, $\times 8$; F, caryopsis and lodicules, $\times 8$; G, ligule, $\times 10$.

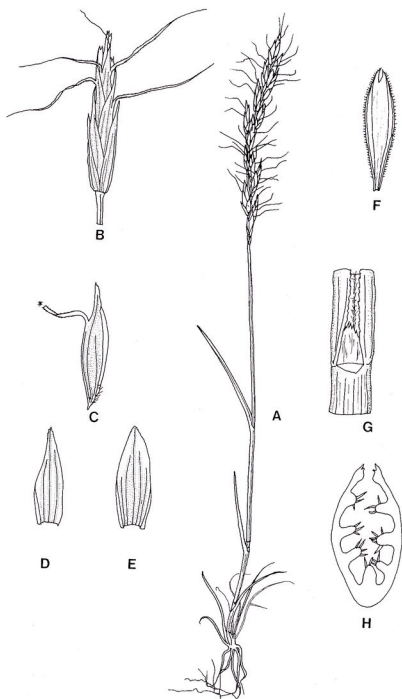


FIG. 2. *Bromus strictostachys*: A, habit, $\times 1$; B, spikelet, showing awnless lowest lemma, $\times 5$; C, floret, side view, $\times 5$; D, lower glume, $\times 6$; E, upper glume, $\times 6$; F, palea, adaxial view, $\times 8$; G, ligule, with part of lamina and sheath, $\times 15$; H, T.S. of lamina, $\times 25$.

panicle development, but the plants here described seem not to have suffered any environmentally induced check to their growth.

In general panicle form, the taxon is extremely reminiscent of *B. alopecurus* Poirét, though much smaller and more delicate. The panicle is stiffly erect and narrow, with densely crowded, adpressed spikelets borne on short branches, or else sessile. A further resemblance to *B. alopecurus* is contributed by the many patent awns, sticking out prominently from the sides of the panicle. If these features are regarded as 'alopecuroid' in terms of *Bromus* morphology, it may be that this taxon has a relationship to *B. scoparius* something like that shown by *B. alopecurus* to *B. lanceolatus*.

The panicle form will eventually need to be checked for phenotypic constancy, but the attribution of species rank does not rest on these characters alone. Additional features distinguishing it from *B. scoparius* are: the long, acute (not short, often truncate) ligules; the stiff, infolded leaves with quite sharp points; the short, dense pubescence of the adaxial lamina surface (*B. scoparius* is normally pilose or has scattered cilia on its leaves); the lowest lemmas in each spikelet lack an awn; the upper glume has sometimes only three (not five) veins; the anthers are two to three times as long as those of *B. scoparius*.

NEW COMBINATIONS

Bromus cappadocicus Boiss. & Bal. subsp. ***sclerophyllus*** (Boiss.) P. M. Smith, **comb. et stat. nov.**

Syn.: *Bromus sclerophyllus* Boiss. Diagn. ser. 1(13):65 (1854).

Type: [Turkey B 2 Manisa]: in monte Tmolio supra Philadelphium [Alasehir] in Lydia, 1842, Boissier (holo. G.).

Bromus variegatus Bieb. subsp. ***villosulus*** (Steudel) P. M. Smith, **comb. nov.**

Syn.: *Bromus villosulus* Steudel, Syn. Pl. Glum. 1:327 (1854).

B. pubescens C. Koch in Linnæa 21:420 (1848) non Muhlenb. (1809) et non Pieri (1834).

B. adjaricus Somm. & Levier in Acta Horti Petrop. 13(1):51 (1893).

Zerna variegata (Bieb.) Nevski subsp. *villosula* (Steudel) Tzvelev in Novit. Syst. Pl. Vasc. (Leningrad) 7:55 (1971).

Bromopsis variegata (Bieb.) Holub subsp. *villosula* (Steudel) Tzvelev, Zlaki SSSR 215 (1976).

Type: [USSR, Georgia]: von Wilhelms aus Grusien erhalten, Hb. C. Koch (holo. B†—type of *B. pubescens* C. Koch).

NOTES ON TYPIFICATION

Bromus hordeaceus L. subsp. ***thominii*** (Hardouin) Maire & Weiller in Maire, Fl. Afr. Nord. 3:256 (1955).

Syn.: *B. thominii* Hardouin, Congres Sc. Fr. 1:56 (1833) non sensu Tutin in Clapham et al., Fl. Brit. Isles, ed. 2:1152 (1962).

Neotype (selected here): [France]: entre Merville et Cabourg [Calvados], mai 1854, L. Hardouin s.n., in Hb. Moquin-Tandon (P!).

The collections of Hardouin are scattered through several major herbaria. It is not difficult to follow the past history of this taxon (Smith, 1968).

Hardouin first referred to the depauperate, sometimes prostrate brome-grass of maritime sand as *B. arenarius* Thomine-Desmazures (1824). He later (1833) replaced this homonym of *B. arenarius* Labill. (1804) with the name *B. thominii*. No material collected by Thomine-Desmazures has been detected but the figure he gives clearly indicates plant material referable to subsp. *thominii*. Hardouin cited no type material. Using the figure published by Thomine-Desmazures and Hardouin's descriptions as guides, I now select as neotype of *B. thominii* the above-cited specimen collected and named by Hardouin. This gathering consists of five plants separately pinned to the herbarium sheet, and is illustrated in Smith (1968).

TIPIFICATION OF LINNAEAN SPECIES

Ten Linnaean species of *Bromus* are recognized in *Flora of Turkey*. Linnaeus cited no type specimens, but quoted synonyms which can be used in some cases to designate lectotypes based either on a specimen (or an illustration) of a pre-Linnaean author. Where there is a Linnaean specimen which can be reliably associated with Linnaeus' intentions and species concept at the time of publication, it is possible to designate it as a lectotype. A problem with the use of pre-Linnaean illustrations as lectotypes of species in critical groups is that they are often insufficiently precise to be convincingly associated with particular species. This is the case in most Linnaean *Bromus* species. The value of the figures is chiefly to indicate general features in the phrase names and synonyms (dense or loose panicles and spikelet shape for instance).

The typification of Linnaean brome-grass species below rests on the Linnaean descriptions and synonyms, the cited illustrations of the latter, and the specimens in the Linnaean collection at the Linnean Society of London (LINN; Savage, 1945). The two specimens of Linnaean *Bromus* in the *Hortus Cliffortianus* (BM) add nothing to our knowledge of Linnaeus' concepts of species occurring in Turkey. Where neotypes are cited below, it is because no type is known to exist.

Bromus secalinus L., Sp. Pl. 76 (1753).

Bromus secalinus probably best represents Linnaeus' concept of the genus *Bromus*. In the inadequately precise treatment in *Flora Lapponica* (1737), Linnaeus described *B. arvensis* first (No. 27), then *B. secalinus* (No. 28)—these species being identified from the application of their phrase-names in *Species Plantarum* (1753). The Scheuchzer reference for No. 27 is transferred to *B. sterilis* in *Species Plantarum* (1753), and his figure is certainly of a plant closely similar to *B. sterilis* L. (see below). Hence Linnaeus' initial conception of *Bromus arvensis* was inherently confused. *B. secalinus* is more clearly defined and is the first-listed species in *Flora Suecica* ed. 1 (1745) and *Species Plantarum* (1753). In Linnaeus' *Genera Plantarum* (1742) the figures referred to as illustrations of *Bromus* are all of brome-grasses in the same section as *B. secalinus*, though not all can be identified precisely with particular species. It seems reasonable to regard

B. secalinus as typifying genus *Bromus*. It was so familiar and common as a contaminant of rye and wheat fields in the eighteenth century that it was probably 'the best-known', if not quite an 'official plant' (*Critica Botanica* No. 246, *vide* Stearn, 1957)!

The specimen on sheet 93/1 is labelled '*secalinus*' by Linnaeus and fits earlier descriptions and illustrations cited by Linnaeus in *Species Plantarum* (1753), as well as the rather specific habitat ('*in agris secalinis arenosis*') in which plants of this species were and are most often found. This specimen has glabrous lemmas and rather short, weak, flexuous awns and agrees with the phrase name in *Species Plantarum* (1753). Since, as will be shown further below, no specimen can confidently be shown to have been identified by Linnaeus as *secalinus* by the date of publication of *Species Plantarum* (ed. 1), I designate this specimen on sheet 93/1 as neotype of *Bromus secalinus* L.

***Bromus hordeaceus* L., Sp. Pl. 77 (1753).**

Linnaeus' concept of *B. hordeaceus* developed over a period of time (Smith, 1968). The taxon was first recognized as a species (1745 and 1753) and later downgraded to a variety of *B. secalinus* ('*secalinus* β ') (1755, 1762) following garden trials—Linnaeus was the first experimental taxonomist! It is conspecific with *B. mollis* (*Species Plantarum* 1762). To determine a type it is necessary to find a specimen or figure which matches Linnaeus' concept of *hordeaceus* in 1753.

There are six sheets in LINN which bear specimens referable to *B. hordeaceus* agg., and which can be associated with *B. hordeaceus* L. or *B. mollis* L.: sheets 93/2, 93/3, 93/5, 93/6, 93/7 and 93/33.

Sheet 93/2 is pinned to 93/1 and has been labelled '*secalinus* β Sp. Pl. 2' by J. E. Smith. It is a robust specimen.

Sheet 93/3 bears two well-grown specimens, one with an illegible note of habitat or location beneath it. Both were labelled '*secalinus*' by Linnaeus at an unknown date though they fit neither the descriptions nor illustrations of that species cited in 1753.

Sheet 93/5 is labelled '*B. mollis*. Algir' by Linnaeus.

Sheet 93/6 (pinned to 93/5) bears two specimens, one of which is labelled 'HU' (Horto Upsaliensi) implying that it was grown in the Uppsala garden.

Sheet 93/7 carries a depauperate specimen labelled '*Bromus nanus*' by Weigel. Linnaeus has labelled it '*secalinus*'.

Sheet 93/33 (pinned to 93/32) bears a densely paniced specimen which Linnaeus has labelled '*scoparius*'. This identification must post-date *Species Plantarum* (ed. 1). It is unlike Linnaeus' other material of *B. scoparius* (see below).

Linnaeus was evidently as puzzled by the variation of *B. hordeaceus* as many botanists before and since. Designation of a type specimen must rest upon the indications of Linnaeus' concept in 1753. It seems reasonable to regard the poorly grown specimen on 93/7 as '*secalinus* β ' (more accurately '*secalinus* α '), i.e. *hordeaceus* of *Flora Suecica* ed. 2 (1755) since he explains its transfer by saying '*Bromus hordeaceus in hortis satus transit in Bromum secalinum, cujus varietas est, ex solo arido et duro pygmaeus*'. None of the other Linnaean specimens can be so closely

associated with remarks about *hordeaceus* by Linnaeus. While the descriptions and figures cited in synonymy by Linnaeus are not very easily ascribed to particular species, they all agree with the phrase name and Linnaeus' cultivation note in pointing to a small plant with a congested panicle of overlapping, hairy spikelets—like 93/7 which I designate as neotype of *B. hordeaceus*.

Lambinon (*Taxon* 30:362, 1981) proposes rejection of the name *B. hordeaceus*, arguing that it is a nomen ambiguum. The reason offered, i.e., that it has often been used in a sense excluding the type, is hardly a persuasive one based as it is on the acceptance of an error by Holmberg (*Bot. Notiser*, 1924: 313–328), and sets an inherently dangerous precedent. Taking Smith (1968) and the present paper together, the typification of *B. hordeaceus* L. is established beyond reasonable doubt.

***Bromus arvensis* L., Sp. Pl. 77 (1753).**

Taking into account the phrase name in *Species Plantarum* and the illustrations cited by Linnaeus, there is only one specimen in LINN which fits *B. arvensis*. It is the specimen labelled '*B. arvensis*' by Linnaeus on sheet 93/21, which I hereby designate as lectotype of *B. arvensis* L.

***Bromus racemosus* L., Sp. Pl. ed. 2, 114 (1762).**

There is a less clear route to the typification of this Linnaean brome-grass than to the others. No specimen in LINN is labelled '*racemosus*' by Linnaeus himself, and the guidance as to his meaning provided by the phrase name in *Species Plantarum* (ed. 2) could fit plants in a number of species. The phrase name, together with the notes at the end of Linnaeus' description, indicate that the plant has a simple panicle, glabrous, ovate-acuminate spikelets, awned lemmas, and laminas abaxially hairy. Only a single synonym is given (from Ray's *Synopsis Britannicum* ed. 3), but this plainly indicates a narrow panicle and glabrous spikelets. No illustration is cited by Linnaeus in *Species Plantarum*.

Only one specimen in the Linnaean herbarium fits this description closely: this is on sheet 93/31, and has been labelled '*B. racemosus*' by J. E. Smith. I choose this specimen as the lectotype of *Bromus racemosus* L. It is not typical of *B. racemosus* but falls within the species as it is now generally defined (e.g. Smith 1973, 1980; Ammann 1981), and is referred to in a letter from Hudson to Linnaeus dated 1760 (in Linnaean Correspondence: Linnean Society of London).

***Bromus scoparius* L., Cent. Pl. 1:6 (1755).**

I designate the specimen on sheet 93/32 as neotype of *B. scoparius*. This material is Loeffling 81, collected in Spain, and so labelled by Linnaeus. It is quite distinct from *B. hordeaceus*, as is implied by the separate treatment of these two taxa in 1755. The only other specimen labelled '*scoparius*' by Linnaeus (93/33) is not at all dissimilar to the other '*hordeaceus/secalinus*' material referred to above (p. 498); it is best regarded as a misidentification by Linnaeus.

***Bromus squarrosus* L., Sp. Pl. 76 (1753).**

I choose, as lectotype of *Bromus squarrosus* L., the specimen on sheet

93/8. Linnaeus has labelled it '2 *squarrosus* L. 79a', indicating it to be the second species in the *Bromus* treatment of 1753, and Loeffling's (L) collection 79a. A second, undoubtedly conspecific, specimen (93/9) is not identified as such by Linnaeus, and has the minor variation of hairy lemmas.

***Bromus sterilis* L., Sp. Pl. 77 (1753).**

Sheet 93/19 bears a specimen labelled '*sterilis* 5' and 'Hisp. 82 Loeffl' by Linnaeus. *B. sterilis* is the fifth species in the treatment of *Bromus* in *Species Plantarum*. The material matches the illustrations cited by Linnaeus reasonably well, as do the plants on 93/20 (pinned to 93/19) which are not so authoritatively labelled. Accordingly, I designate Loeffling 82 on sheet 93/19 as the lectotype of *B. sterilis* L.

***Bromus tectorum* L., Sp. Pl. 77 (1753).**

Two specimens in the Linnean Society collection, on sheet 93/23, are labelled '7 *tectorum*' by Linnaeus, together with the habitat note '*tectis*' which agrees with the entry in *Species Plantarum*. This identification and citation of order number by Linnaeus plainly shows, as in other similar cases here discussed, that the specimen was associated by Linnaeus with his treatment of 1753. This element may therefore fairly be regarded as a syntype. I designate 93/23 as the lectotype of *B. tectorum* L.

Another *B. tectorum* specimen, on sheet 93/25, has been so labelled by J. E. Smith, not Linnaeus. An incomplete specimen in Stockholm (IDC fiche no. 40.19) has been labelled '*tectorum*' by Linnaeus *filis*, and the number 7, not associated with the identification, is of uncertain origin. This specimen may possibly be a syntype, but because it is a less certain and less adequate one, I set it aside.

***Bromus madritensis* L., Cent. Pl. 1:5 (1755).**

I select the specimen on sheet 93/35, collected by Loeffling and labelled '*madritensis*' by Linnaeus, as neotype of *B. madritensis*. The annotation ('near *rubens*') by J. E. Smith is misleading: this plant is unlike *B. rubens* L. (q.v.) Other sheets of material conspecific with 93/35 (93/36, 93/37, 93/38 and 93/39) are not labelled by Linnaeus.

***Bromus rubens* L., Cent. Pl. 1:5 (1755).**

The neotype here chosen of *B. rubens* L. is the Linnaean specimen on sheet 93/28. It is labelled '*rubens*' by Linnaeus, and was collected in Spain by Loeffling (Loeffling 84). Sheet 93/29 bears a conspecific specimen but has no annotations by Linnaeus.

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REFERENCES

- AMMANN, K. (1981). Bestimmungsschwierigkeiten bei europäischen Bromus-Arten. *Bot. Jahrb. Syst.* 102: 459-469.
- PENZES, A. (1936). Roznok tanulmanyok. *Bot. Kozl.* 33: 98-138.
- SAVAGE, S. (1945). *A Catalogue of the Linnean Herbarium*. London.
- SCHOLZ, H. (1972). Bromus brachystachys Hornung and Br. pseudobrachystachys H. Scholz. spec. nov. *Bot. Jahrb. Syst.* 91: 462-469.
- (1978). Synaptospermie und Heterodiaspory in der Gattung Bromus (Gramineae). *Willdenowia* 8: 341-350.
- SMITH, P. M. (1968). The Bromus mollis aggregate in Britain. *Watsonia* 6: 327-344.
- (1969). Serological relationships of Bromus L. and Boissiera Hochst. ex Steud. *Feddes Repert.* 79: 337-345.
- (1973). Observations on some critical brome-grasses. *Watsonia* 9: 319-332.
- (1980). Bromus L. in TUTIN, T. G. et al. (eds.) *Flora Europaea* Vol. 5, 182-189. Cambridge.
- (1983). Proteins, Mimicry and Microevolution in Grasses. In JENSEN, U. & FAIRBROTHERS, D. E. (eds.). *Proteins and Nucleic Acids in Plant Systematics*, 311-323. Berlin.
- STEARNS, W. T. (1957). An introduction to the Species Plantarum and cognate botanical works of Carl Linnaeus. In LINNAEUS, C. *Species Plantarum. A Facsimile of the First Edition 1753*: v-xiv, 1-176. London.